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Tgard 300 Reliability Report

Purpose.

Provide reliability data on Tgard300 performance over time when exposed to various environmental conditions.

Material.

- Specimens of Tgard300 cut in circles with 1 in^2 area and placed between two aluminum discs with the same area (for thermal resistance test)

- A 20”X10” sheet of Tgard300 (for dielectric breakdown voltage test)

Aging Conditions.

- HAST chamber
  The chamber was set at 85 ℃ and 85 % RH.

- Bake at 150 ℃.
  Standard forced air oven. Unit has automatic controller and was monitored with thermocouple to external Fluke unit.

- Thermal Shock.
  Temperature in hot section was set to 150 ℃ and the cold section was set to -40 ℃. There were 24 cycles per day.

Test Method.

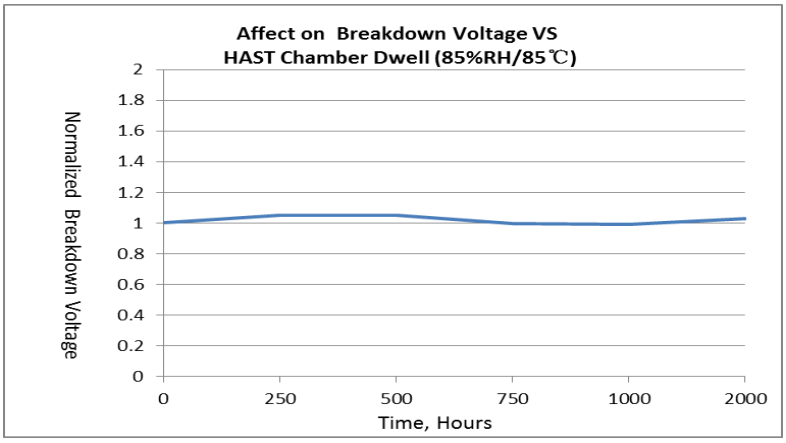
- Dielectric Breakdown Voltage Test
  20”X10” sheet of Tgard300 were prepared for the test, and the measurements were taken at 0, 250, 500, 750, 1000 and 2000 hours and dielectric breakdown voltage was measured using D 149-97.

- Thermal Resistance Test
  Thermal resistance measurements were taken at 0, 250, 500, 750, 1000 and 2000 hours and thermal resistance was measured at 10psi and 50 psi using modified D 5470 test method.

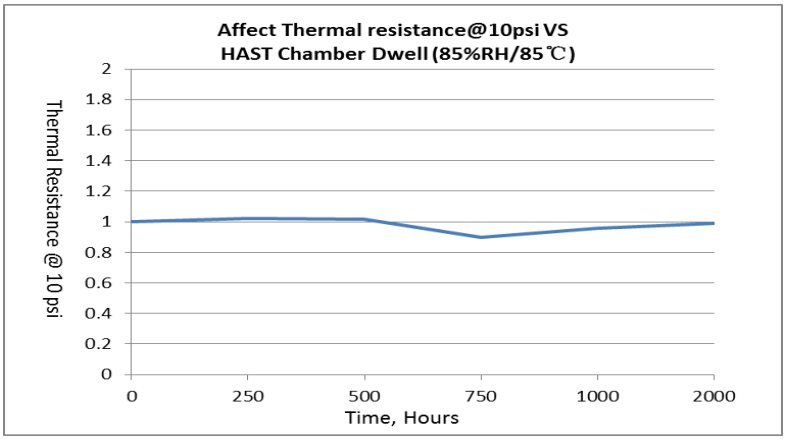
Reliability result.

- HAST reliability result

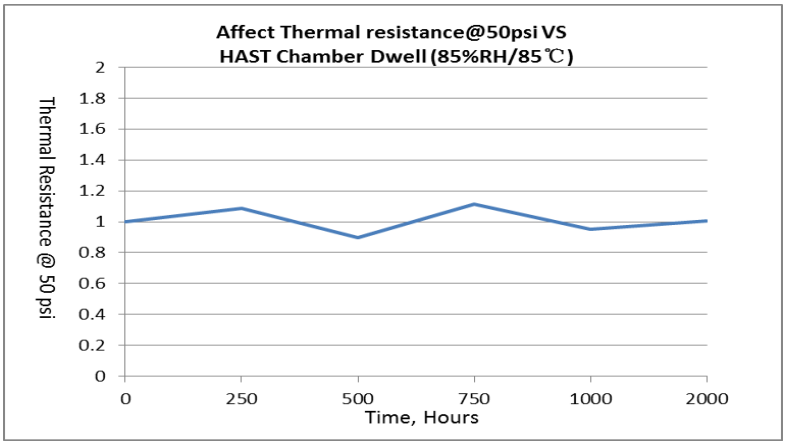
Graph 1



Graph 2



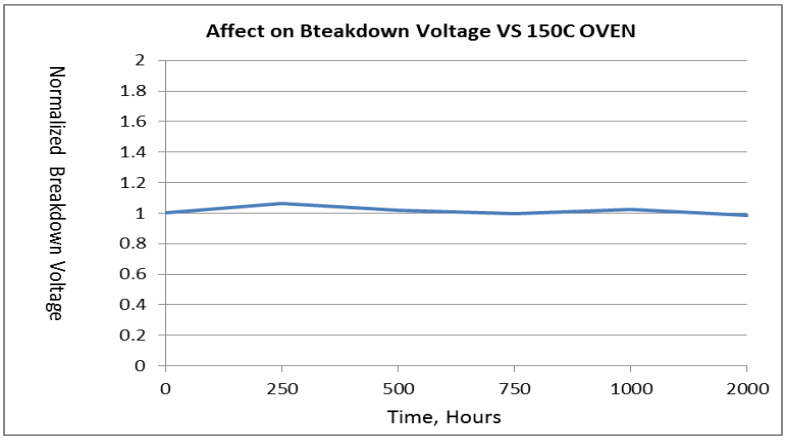
Graph 3



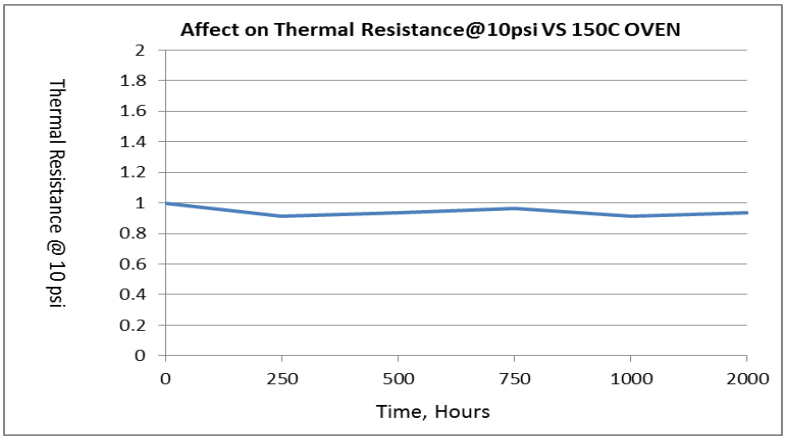
Graph1, 2, 3 show the results of HAST chamber aging effect, the dielectric properties of Tgard300 were not affected by the exposure to 85 % relative humidity and 85 ℃ of 2000 hours, and the thermal resistance at 10psi was stable with time increase, and it was fluctuated slightly within 10% range at 50 psi and then eventually stabilizes as time of exposure increases.

- Bake at 150^0C reliability result

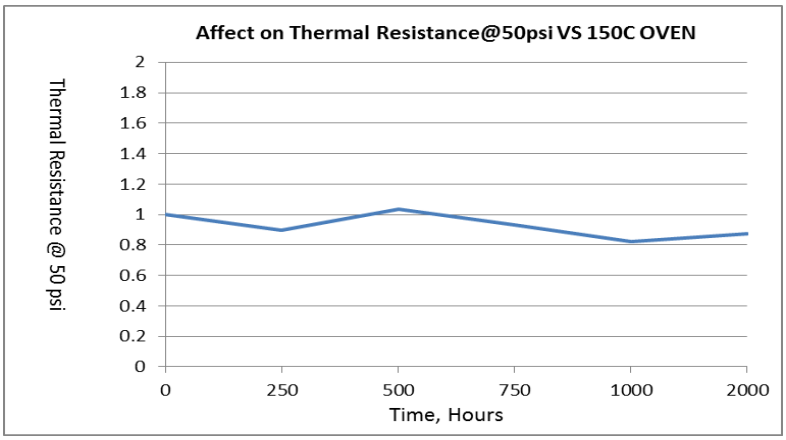
Graph 4



Graph 5



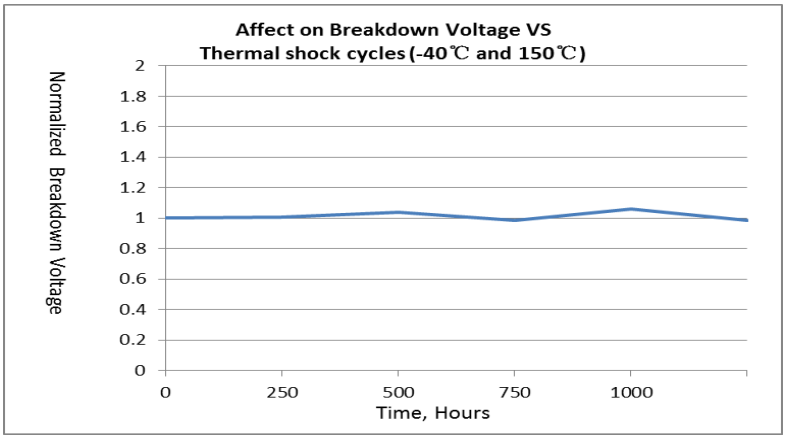
Graph 6



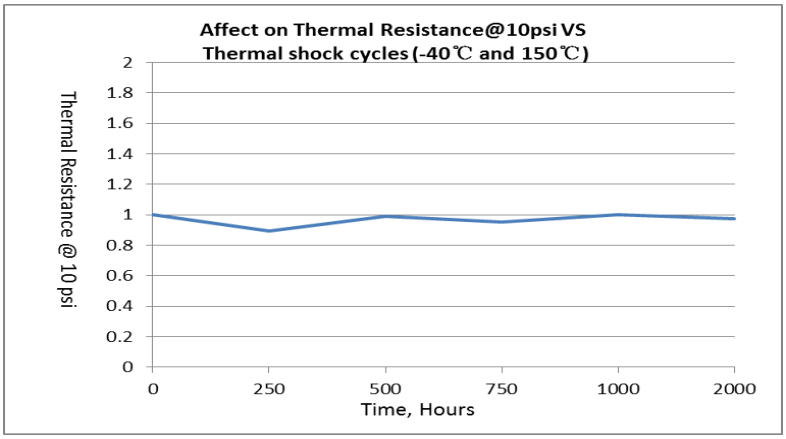
Graph4, 5, 6 show the results that dielectric properties and thermal resistance at 10psi were stable during the testing, and it was fluctuated slightly at 50 psi as time of exposure increases.

- Thermal Shock reliability result

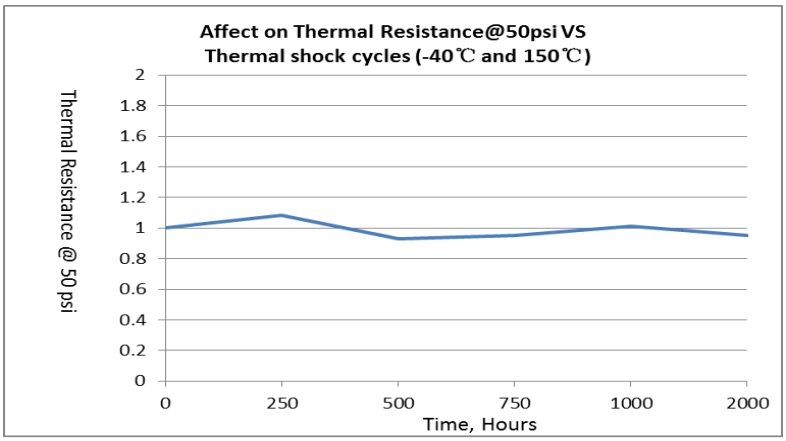
Graph 7



Graph 8



Graph 9



Graph7, 8, 9 indicate that Tgard300 maintains its thermal, and dielectric qualities after exposure to 2000 thermal shock cycles between -40 ℃ and + 150 ℃.

Conclusion.

The results above indicate that dielectric strength was very stable and not influenced when exposed to various environmental conditions.

The thermal resistance at 10 psi was stable with time increased, thermal resistance at 50 psi was fluctuated slight range by the exposure to 85 %RH and 85 ℃ and oven exposure to 150 ℃.